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American Foundryman

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The 1939 Program



IT WAS not many years ago that the demise of the foundry industry was forecast and many said that soon there would be no need for castings. This forecast probably was the result of too much enthusiasm for other methods of fabrication.

It is now generally recognized that the foundry industry has made great strides under the stimulation of this competition. Regardless of the cause, during the past ten years, the foundry industry has made more progress than in the previous 50 years. The American Foundrymen's Association is proud to have had a part in bringing many of the important developments to its members through papers and discussions presented at its conventions.

However, an industry must not rest on its laurels. Competition from other methods of fabrication demands that the industry continue to advance. One of the methods—and perhaps the best—is by the free interchange of information whereby new processes, new products, new materials are made available to the entire industry.

As announced in this issue of *American Foundryman*, the 1939 convention of the American Foundrymen's Association will be held in Cincinnati, Ohio, without an exhibit. At this convention, it will not be necessary for members to divide their time between the exhibit and the technical meetings. The technical program will be the high spot of the convention. To this end, all members should bend their efforts toward securing the best possible information for presentation at the convention and should plan to attend for the purpose of advancing themselves, their companies and the whole foundry industry.

It is the duty of the program committees of the various divisions of the Association to secure and select papers on worthwhile and interesting subjects of practical benefit to their respective divisions of the industry. Members having new information or knowledge of new or old processes, products, materials, supervisory methods, cost methods, etc., are requested to get in touch with their respective program committee chairmen and to do their part to make the 1939 technical program the most outstanding ever presented.

A handwritten signature in cursive script, reading "A. W. Gregg".

Chairman, Policy Committee of Program
and Papers Committee.

A. W. Gregg is foundry engineer, foundry equipment division, Whiting Corp., Harvey, Ill., has had a long career in the foundry industry, and has been active in Association affairs for many years. In addition to serving as chairman of the Policy Committee of the Program and Papers Committee, Mr. Gregg also is a director of the Chicago Chapter and a member of the Steel Division Executive Committee.

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American Foundryman



C O N T E N T S

October, 1938

Volume I

No. 4

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Automotive Steel Castings†

By R. H. McCarroll*, Detroit, Mich.

IN presenting a paper to you on the contributions of the Ford Motor Company to the development of automotive steel castings, we do not feel that it is necessary to describe in detail the materials and methods used on parts which have been in production for some time. Many of these major developments such as the casting of valves, crankshafts, pistons, etc., have been described by editors and special writers in a better manner and in more detail than is possible here. However, a full list of these publications will be found for reference at the end of this paper.

Instead, we will only mention these early parts, giving the date of first large scale production and an estimate of the number and weight so far produced. We will then tell you something of the work now in progress, although changes and improvements come so rapidly that some of this story may soon seem like ancient history, and finally discuss briefly what these developments may mean to the industries concerned.

At present, there are not less than 149 lb. of finished cast steel parts going out in each Ford car. We say not less because this is being ex-

ceeded in cases of experimental production on some parts.

The regular parts are as follows:

Valves—started in 1931, of which over 56.5 million have been produced, weighing finished more than 5,225 tons.

Crankshafts—started in 1933, of which over 4.5 million have been produced, weighing finished more than 137,000 tons.

Valve Seats—started in 1934, of which more than 34 million have been produced, weighing more than 695 tons.

Wheel Hubs—started in 1935, of which over 8.25 million have been produced, weighing more than 67,850 tons.

Pistons—started in 1935, of which more than 16 million have been produced, weighing more than 5,000 tons.

While this paper deals with the use of cast steel parts, it might be well to illustrate here two notable exceptions where alloy iron parts have replaced steel forgings. These are the push rod and camshaft. We have selected these two parts because of their unusual composition and treatment, because they have replaced steel parts and because they have so improved quality and decreased cost.

†Presented before Fall Technical Conference, American Foundrymen's Association, University of Michigan, Ann Arbor, Michigan, September 16, 1938.

*Ford Motor Co.

Table I
CAST STEEL ANALYSIS CHART

| Type. Parts | C. | Cup. | Si. | Composition, Per Cent | | Cr. | P. | S. | Heat Treatment and Hardness |
|---|-----------|-----------|-----------|-----------------------|-------|------------|-----------|------------|---|
| | | | | Mn. | Mo. | | | | |
| 1 Clutch Pedals and Steering Wheel Hub | 0.15-0.35 | 1.50-2.00 | 0.60-0.80 | 0.40-0.60 | ..... | ..... | 0.08 Max. | 0.08 Max. | Normalize to Brinell — Hardness of 163 - 207 |
| 2 Truck Ring Gears and Parts to be Carburized | 0.28-0.35 | 0.50-1.50 | 0.40 Max. | 0.30-0.45 | ..... | 0.90-1.20 | 0.05 Max. | 0.05 Max. | Normalize — Carburize and direct quench or reheat and oil quench and draw to Rockwell "C" 58-62. |
| 3 Centrifugal Castings. Trans. Countershaft and Differential Ring Gears | 0.35-0.40 | 0.50-1.50 | 0.40 Max. | 0.65-0.80 | ..... | 0.90-1.10 | 0.05 Max. | 0.05 Max. | Normalize to Brinell Hardness 170-196. Harden gears as per part prints. |
| 4 Rear Axle Shaft Housing Flange Truck Universal Joint Housing. Connecting Rods | 0.35-0.45 | 0.50-1.50 | 0.40 Max. | 0.70-0.90 | ..... | ..... | 0.10 Max. | 0.08 Max. | Normalize to Brinell Hardness 163-207. Universal joint housing to remain as normalized. Rear axle shaft housing flange — Harden as per part print. Connecting rods — oil quenched and drawn to Brinell 255-286. |
| 7 Truck Rear Axle Housing Tube | 1.35-1.55 | ..... | 0.90-1.10 | 0.40-0.60 | ..... | 0.08 Max. | 0.10 Max. | 0.08 Max. | Normalize to Brinell Hardness 170-228. 1650° F. at heat 20 min. Air cool to a max. of 1200° F. Reheat to 1400° F. Hold for 1 hr. Furnace cool to 1000° F. Brinell 255-321. Parts to be hardened may be oil quenched and drawn to Rockwell "C" 52-60. |
| 8 Crankshaft Bearing Sleeves and Parts to be Hardened | 1.35-1.60 | 1.35-2.00 | 0.85-1.10 | 0.70-0.90 | ..... | 0.40-0.50 | 0.10 Max. | 0.08 Max. | 1650° F. at heat 20 min. Air cool to a max. of 1200° F. Reheat to 1400° F. Hold for 1 hr. Furnace cool to 1000° F. in 1 hr. Brinell Hardness 190-228. |
| 9 Piston | 1.40-1.60 | 1.00-1.50 | 0.90-1.10 | 0.80-1.00 | ..... | 0.08-0.15 | 0.10 Max. | 0.08 Max. | 1450° F. at heat 30 min. Cool in 3 hrs. to 1000° F. Rockwell "C" 38-46. |
| Valve Insert | 1.20-1.40 | 1.50-2.00 | 0.30-0.60 | 0.30-0.50 | ..... | 2.5 -3.5 | ..... | 14.0 -17.0 | W. Rough grind. Restrike. Anneal at 1550° F. for 30 min. Cool slowly. Rockwell "C" 22 min. |
| Valves | 0.95-1.20 | ..... | 2.0 -3.5 | 0.20-0.30 | ..... | 15.0 -16.0 | ..... | 14.0 -15.0 | Ni. |

The V-8 push rod started in 1933, over 60 million having been produced, weighing more than 3,500 tons. The camshaft started in 1935, over 3 million having been produced, weighing more than 12,000 tons. You will find their manufacture described in the references listed.

Classes of Cast Steels

As an introduction to the work now in progress, let us first look at the analyses of the materials available and their physical properties. For convenience in specifying, we have divided our list of cast steels into seven classes, and in addition have special analyses for the valve and valve seat inserts. These specifications are shown in Table 1, which shows class number, representative parts, analysis and some typical heat-treatments.

There has been considerable discussion as to the proper name for some of these materials, particularly in the higher carbon ranges like that used for crankshafts. This we would like to further discuss at this time.

Definition of Copper-Silicon Metal

Among the bibliography listed, you will find an interesting article by H. W. Russell of the Battelle Memorial Institute, published in *Metals and Alloys*, December, 1936, titled "Resistance to Damage by Overstress of Precipitation-Hardened Copper-Steel and Copper-Malleable." The publishers were kind enough to include with this article some comments of ours giving our reasons for classifying this material as steel, rather than under the term "Pearlitic Malleable" used by Mr. Russell. Because we believe this is important to all of us, we would like to repeat those comments here.

First: Referring to the iron-carbon diagram, this material is within the range previously defined as steel.

Second: The modulus of elasticity of this material is within the usual steel range, being from twenty-eight to thirty million and not within that of gray iron or that of malleable iron.

Third: Referring to the publication of a discussion at a meeting of the American Foundrymen's Association on "Pearlitic Malleable Irons" presented January 27, 1936, at Cleveland, reference is made to high carbon cast steel as differentiated from pearlitic malleable because such steels as cast are solid, homogeneous single phased alloys. We believe that our crankshaft material fits these definitions of the A.F.A. for high carbon cast steel.

Fourth: The Ford Motor Company has a so-called

quick malleable, often given a heat treatment, leaving it purposely partially pearlitic, referred to in U. S. Patent No. 1,871,545 (McCarroll and Vennerholm).

Fifth: This crankshaft material does not fit the definition given by Bornstein and Bolton in the A. S. M. Handbook for any type of cast iron.

So much for the technical reasons, but beyond this, we have, we think, some very practical reasons.

Among the general public, non-technical executives, and others who are not familiar with the progress in cast metals in the past few years, cast iron means a weak brittle material. Many of these people think of cast iron and, in some cases, all cast materials, as stove plate iron which, when they drop it on the floor, will break into many pieces.

It is our opinion that the foundry industry and all others in a position to know, should help in this matter of definition as a means of education regarding the difference in physical properties and the suitability of some of these newer materials for parts which could not previously be cast satisfactorily. The term "satisfactorily" really is far too weak here. While numerous manufacturing advantages resulting from a change to steel castings are cited below, we would like to emphasize that the cast steel parts have almost always given better results in actual service than the forged part it replaced, and always at least as good. Another requirement is that the cast part must never weigh more. In almost all cases the weight has been less.

Here, only the simple physical properties of some of the cast materials, such as shown in Table 2, will be considered. We have attempted to select average results and compare them with ordinary malleable, our so-called quick malleable and rolled steel. We are deferring until later any consideration of fatigue tests notch effect or the effect of grain flow as the result of forming.



Fig. 1—New Sand Cast Automotive Parts

Work in Progress

To go on with the work in progress, parts which are on small scale production, we will consider under two divisions: First, those which are being sand cast in stationary molds; and second, those which are being centrifugally cast in permanent molds. Illustrating some of these newer sand cast parts, let us call your attention to Fig. 1.

for a passenger car. Beside it are shown the two forgings which were formerly welded together, at the place shown, to make an assembly. Here, one casting replaces two forgings. The castings for this part are made from copper-silicon steel, No. 4, Table 1, and are heat-treated to a Brinell hardness of 163-207. Two castings are used per car and they are butt welded

drive shaft tube. The material specified is copper-silicon steel, No. 4, Table 1. The castings are normalized before machining in the same manner as the forging.

The reason that malleable castings cannot be used for these three parts, even if the sections were made large enough to have sufficient strength, is, of course, because of the welding of these parts into the assembly.

There are many other parts under this classification which are being cast experimentally, either by ourselves or our suppliers, but we will not discuss them now.

Centrifugal Casting Possibilities

We now come to the consideration of the work we are doing on the centrifugal casting of automotive steel parts. Some information has already been published on this, as you will see by referring to the bibliography. There has been a great deal of interest shown in this work.

Centrifugal casting is, of course, not new. We are all familiar with the centrifugal casting of iron pipe and the work done in centrifugally casting iron against steel backing plates. Even the centrifugal casting of steel is not new, railway car wheels have for many years been manufactured by this method, and much work has been done on the centrifugal casting of steel ingots and billets.

We do believe, however, that the centrifugal casting of rela-

Table 2
COMPARATIVE PHYSICAL PROPERTIES
Physical Properties of Test Bars

| Type. | Elastic Limit, Lb. per Sq. In. | Tensile Strength, Lb. per Sq. In. | Elongation, in 2 in., Per Cent. | Brinell Hardness. |
|----------------------------|--------------------------------|-----------------------------------|---------------------------------|-------------------|
| No. 1 | 53,800 | 71,100 | 18.5 | 163 |
| No. 2 | 56,500 | 78,000 | 16.5 | 170 |
| No. 3 | 62,000 | 86,000 | 16.0 | 184 |
| No. 4 | 65,120 | 90,750 | 15.2 | 187 |
| No. 4 Hardened.. | 108,150 | 128,620 | 10.0 | 277 |
| No. 7 | 84,000 | 103,000 | 9.0 | 207 |
| No. 8 | 95,080 | 120,250 | 6.5 | 255 |
| No. 9 | 85,000 | 104,710 | 7.5 | 229 |
| Reg. Malleable.. | 38,000 | 52,000 | 15.7 | 119 |
| Ford Malleable.. | 43,000 | 60,500 | 14.0 | 140 |
| 0.30 Carbon Forged Steel.. | 60,000 | 85,000 | 27.0 | 165 |
| 0.40 Carbon Forged Steel.. | 80,000 | 110,000 | 20.0 | 225 |

At the top of Fig. 1 will be seen a casting for the truck rear axle housing. Two of these are used in each truck, being riveted to each side of the center malleable bell housing castings to make the complete axle housing assembly.

In this illustration, directly under the rear axle housing casting, is shown the previous tubular section, swedged down on the end, and the two forgings which were welded on, in locations shown, to make an assembly. In this case, we have one casting taking the place of three separate pieces.

We would like to call your attention to the comparative wall thickness of different sections of these parts as made by the two different methods. Being able to vary your wall thickness as desired and put the metal just where you want, is a great advantage in favor of castings.

This casting is made from copper-silicon steel, No. 7, Table 1, and annealed and air cooled to a Brinell hardness of 170-228.

The casting, shown at the lower left in Fig. 1, is that of a rear axle end and spring perch

to the outer ends of the rear axle housing tube.

The third part, shown at the lower right of Fig. 1, is the truck drive shaft universal end. Here, one casting replaces only one forging, but we have a considerable weight advantage in that the rough casting weighs only 8½ lb., while the rough forging weighs 10 lb. 6 oz. The weight of the finished machined part is 6 lb. 1 oz. One of these parts is used in each truck and is butt welded to the front end of the



Fig. 2—Centrifugal Casting Machine at Ford Motor Co.

tively small parts, such as we are about to consider, is new.

Three of the main advantages of this method of fabrication are:

1. Better structure.
2. Extremely high yield of castings when compared to back-stock.
3. The ability to use a less fluid metal, which means lower pouring temperature and less damage to the mold, and also the possibility of more easily casting lower carbon steel.

Fig. 2 gives a picture of the present state of development of our centrifugal casting machine. It consists essentially of a turntable 22 ft. in diameter on which

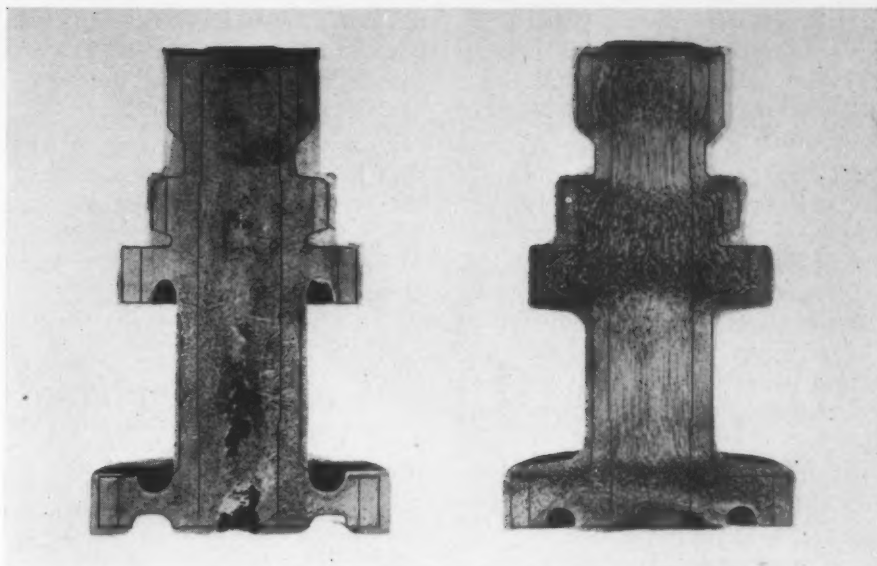


Fig. 4—Etched Macro-Sections of Cast and Forged Gears



Fig. 3—Centrifugal Mold and Cores Used and Castings Produced

there are eighteen stations for rotating heads. You will note there are as yet only six heads or pouring stations installed, and that very little mechanical handling equipment is complete. The turntable makes one revolution every 4 min. Each head is driven by an individual motor turning at 400 r. p. m. We estimate that this machine, when completed, should produce more than 8,000 gears, such as the transmission cluster gear, in 16 hr. The pouring temperature is about 2900° F.

The next illustration, Fig. 3, shows the steel mold and cores now being used on this machine to produce the double casting for the two gears shown at the

right in this same figure. We believe that the position and purpose of the six cores shown will be easily understood by their relative locations in the photograph.

Dead load tests of the finished gear made from the casting show it to be fully as good as the gears made from forging. This is also true of impact tests on gear teeth. Life tests under overload of the finished transmissions show the cast gear to have a considerable advantage.

Part of the explanation for this is shown in Fig. 4. This illustration shows a section of the cast gear at the left and the forged or upset gear at the right. Both sections have been etched

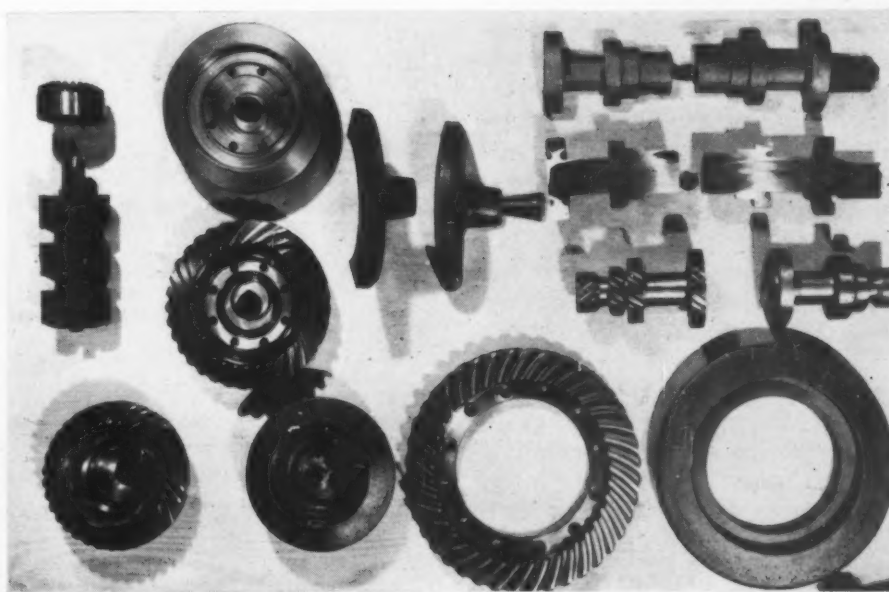


Fig. 5—Centrifugal Steel Castings

to the same degree to show the structure of the metal. Lines have been laid out on each section to show the finished machined size.

In the case of the cast gear, the best structure will be found where most strength is needed. The poor structure in the center is removed by drilling the hole for the shaft. In the case of the forged gear, a weakness will be found parallel and near the base of the gear teeth where the greatest strength is needed.

Microphotographs are not being shown here, as both are very



R. H. McCarroll

similar, even as to grain size, this being 5 to 7.

In Fig. 5 are shown first, at the upper right, this same transmission gear with feeders in position; second, at lower right, the truck rear axle ring gear; third, the passenger car ring gear; and fourth, other gears which have been produced on an experimental scale.

We cannot discuss at any length the effects such developments may have on the industries concerned. They certainly point to a definite trend towards the replacement of forgings by castings. However, this competition is spurring forging sources to greater efforts and we have one case in the past year where a forging replaced a casting, to advantage. This competition furthers greater progress and bene-

fits both the user of the finished part and the ultimate consumer, this being in our case the automobile purchaser.

It is hardly necessary to say that Mr. Ford has been, not only the inspiration for most of this progress, but the source of many of the ideas that made its success possible.

References

CAST STEEL CRANKSHAFTS

Finney, Burnham, "Casting the Ford V-8 Crankshaft," *Iron Age*, March 15, 1934.

"Eight Fewer Operations Required to Produce Ford Cast Crankshafts," *Automotive Industries*, March 17, 1934.

Dwyer, Pat, "Making the Ford Cast Alloy Crankshafts," *Steel*, March 19, 1934.

Dwyer, Pat, "Ford Foundry Casts V-8 Engine Crankshafts," *The Foundry*, April, 1934.

Cone, Edwin F., "The Story of the Ford Crankshaft," *Metals and Alloys*, October, 1935.

Pioch, W. F., "How Ford V-8 Crankshafts Are Cast and Machined," *S. A. E. Journal*, May, 1936.

CAST IRON CAMSHAFTS

"Ford Improves Quality and Cuts Cost by Casting Camshafts," *The Iron Age*, August 15, 1935.

Cone, Edwin F., "Manufacture of Ford Camshafts—How Metallurgical Control Is Achieved," *Metals & Alloys*, November, 1936.

CAST STEEL PISTONS

Geschelin, Joseph, "How Lincoln Makes Thin-Wall Steel Pistons for Zephyr's New Engine," *Automotive Industries*, January 11, 1936.

"Auto Pistons Cast Horizontally," *The Foundry*, April, 1936.

Cone, Edwin F., "The Lincoln-Zephyr Cast Alloy Piston," *Metals & Alloys*, April, 1936.

CAST ALLOY VALVES

"Ford Casts Parts of Alloy Iron and Steel," *The Foundry*, February, 1936.

CAST ALLOY VALVE SEATS

Cone, Edwin F., "The Manufacture of Valve Seat Inserts," *Metals & Alloys*, April, 1937.

CAST STEEL BRAKE DRUMS

Cone, Edwin F., "The Metallurgical Story of Ford Brake Drums," *Metals & Alloys*, November, 1937.

Allen, A. H., "Ford Engineers Pushing Into New Fields for Cast Parts," *Daily Metal Trade*, February 4, 1938.

"Spinning Mold Used for Ford Cast Gear," *Automobile Topics*, May 2, 1938.

"Ford Motor Develops Centrifugal Steel Casting," *Automotive Industries*, June 11, 1938.

Sherman, W. F., "Ford Casts Ring Gears in Centrifugal Molds," *Iron Age*, July 21, 1938.

GENERAL

McCarroll, R. H., and McCloud, J. L., "Ford Alloy Castings," *Metal Progress*, August, 1936.

Cliff Connelley Dies

Clifford B. Connelley, one of the leaders in the vocational education movement in the country, died Sept. 29, at his home in Pittsburgh. Mr. Connelley was known as the father of vocational education in Pittsburgh.

Born in Monongahela, Pa., 75 years ago last May, Mr. Connelley's first job, at 11 years of age, was with a steel company. Educating himself during his work in mills and with engineering firms, he determined to give younger men an opportunity for vocational education. During his fight for this goal, he attracted the attention of Andrew Carnegie who selected him as one of three men to lay out the grounds and courses of study when, what is now Carnegie Institute of Technology, was formed. He served this institution for many years as head of the school of apprentices and journeymen and later as Dean of the school of industries. He retired in 1928.

Mr. Connelley was very active in the work of the A.F.A. apprenticeship committee for many years. He also served as director from 1922-24.

Book Review

Welding Handbook, 1938 edition, cloth bound green, 1211 pages, published by the American Welding Society, 33 W. 39th street, New York, N. Y.

This volume contains 60 chapters dealing with the fundamentals of various welding processes, materials and testing methods used and their applications. The handbook is well illustrated with drawings, diagrams, micrographs and symbols to illustrate the work of the welding industry. This handbook is of interest to both ferrous and non-ferrous foundrymen since it deals with the methods of cutting, flame hardening, soldering, brazing, metal spraying, and stress relieving of castings after welding. The effects of alloyed and carbon steels on welding also are discussed from both a metallurgical and engineering standpoint.

AMERICAN FOUNDRYMAN

Cincinnati

The 1939 Convention City

CINCINNATI, one of the large foundry centers of the country, has been chosen as the place of the 1939 Annual Convention of The American Foundrymen's Association. The dates are from Monday, May 15, through Thursday, May 18, 1939.

The 1939 convention will be held without an exhibit and will be patterned after the successful technical meetings held in Chicago at the Edgewater Beach Hotel in 1927 and in Toronto at the Royal York Hotel in 1935. The entire program will be devoted to technical, management, and general interest sessions, shop operation courses, round table discussions, committee meetings, plant visitations and social functions that add to the enjoyment of Annual Foundrymen's Week.

Cincinnati was selected from among the several cities under consideration by a special convention committee whose recommendation was unanimously approved by the Board of Directors. Local interest, geographical location, hotel accommodations and the importance of the metal manufacturing industry in Cincinnati district were determining factors.

Personnel of convention committee, appointed to consider invitations and make recommendations as to the convention city, was as follows:

H. Bornstein, director of laboratories, Deere & Co., Moline, Ill.; L. N. Shannon, vice president, Stockham Pipe Fittings Co., Birmingham, Ala.; W. H. Doerfner, general manager, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.; H. S. Hersey, vice president and general manager, The C. O. Bartlett & Snow Co., Cleveland, O.; Thomas Kaveny, president, Herman Pneumatic Machine Co., Pittsburgh, Pa.; P. J. Potter, vice president, Pangborn Corp., Hagerstown, Md.;

C. E. Hoyt, executive vice president, American Foundrymen's Association, Chicago, Ill., chairman.

Last Call for Purdue Conference

THE program for the Purdue Foundry Conference, to be held at Purdue University, West Lafayette, Ind., Oct. 27, 28, 29, sponsored jointly by the Chicago Chapter, and the University, is now complete and final arrangements have been made. The program was published in the September issue of *American Foundryman*, pp. 4 and 5.

Hotel reservation blanks, posters and return cards have been sent to foundries of the area by the publicity committee of the Chicago Chapter and this committee asks those who intend to attend to please mail such cards showing your intention to participate in this regional conference as soon as your plans have been made.

The program includes an outstanding array of speakers on subjects of practical interest to gray iron, malleable and steel foundrymen throughout the area. The dinner scheduled for Thursday evening will present Prof. J. L. Bray, head, School of Chemical and Metallurgical Engineering, Purdue University, in an interesting description of his experiences on a commercial sword fishing boat and will feature the Purdue Concert Choir under the direction of Albert P. Stewart. This organization has a national reputation in the music world.

Charley Gale, First A. F. A. Life Member, Dies

Charles H. Gale, one of the best known foundrymen of the country and a Life Member of



Cincinnati Skyline

the American Foundrymen's Association, died at the home of his son, G. W. Gale, Grand Rapids, Mich., on Sept. 26, at 81 years of age. He had not been actively connected with the foundry industry since 1922.

Born in Detroit, he began his foundry career with the Michigan Stove Co., Detroit, in 1874, as an apprentice molder. He remained with that company for 8 years with the exception of 15 months when he went to Europe and worked in foundries in France and Germany.

He later became connected with the Michigan Malleable Iron Company where, during his 16 years' stay, he rose to the superintendency of the shop. For the next 5 years, he was superintendent, gray iron and malleable foundries, International Harvester Co., Springfield, O. In 1904, he was appointed superintendent, Pennsylvania Malleable Co., McKees Rocks, Pa., which later was taken over by the Pressed Steel Car Co.

Mr. Gale was a regular attendant at A.F.A. conventions and took an active part in the activities of the association during its formative years.



Regional Meetings

Second Fall Technical Conference Features Lively Discussions

THE Second Fall Technical Conference, sponsored jointly by the American Foundrymen's Association, University of Michigan and the Detroit Chapter of A.F.A., and held at the Union Building, University of Michigan, Ann Arbor, Mich., September 15, 16 and 17, was a decided success. Although attendance was less than anticipated, this deficiency was more than made up by the quantity, quality and interest disclosed by the discussions. Many foundry metallurgists throughout the country have reason to regret

that they did not attend this meeting.

Thursday morning, Sept. 15, was devoted to a discussion of malleable iron problems. Dr. E. Touceda, Malleable Founders' Society, Albany, N.Y., acted as chairman in absence of H. M. Wright, Michigan Malleable Iron Co., Detroit, who was unable to attend. J. H. Lansing, Malleable Founders' Society, Cleveland, discussed the annealing of malleable iron while J. A. Dow, Holcroft & Co., Detroit, spoke on controlled atmospheres for malleable annealing furnaces.

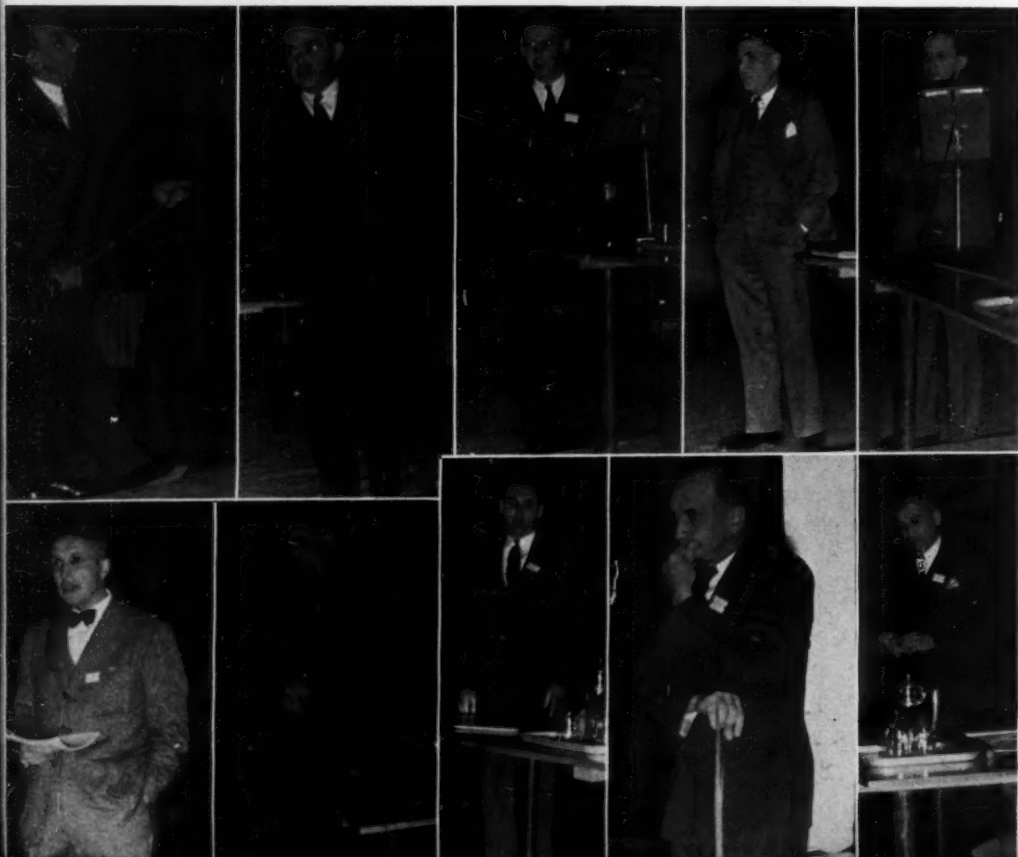
The afternoon session, at which E. R. Darby, Federal-Mogul Corp., Detroit, presided, was devoted to discussions on the age-hardening of cast metals. L. W. Kempf, Aluminum Co. of America, Cleveland, gave an excellent discussion of the mechanism of this phenomena and its application to castings. A. B. Kinzel, Union Carbide & Carbon Research Laboratories, New York, N. Y., discussed the problems involved in the production of high conductivity alloys. Mr. Kinzel's discussion centered around the properties obtained and production technique necessary to the manufacture of age-hardenable copper-chromium alloys with high conductivity.

Friday morning, Sept. 16, was devoted to discussions on cast iron theory. V. A. Crosby, Climax Molybdenum Co., Detroit, presided at this session. The first paper, "Transformation Rates of Austenite in Cast Iron," by Prof. W. P. Wood, Dr. D. W. Murphy and C. D. D'Amico, University of Michigan, was presented by Dr. Murphy. The second paper, "Effect of Undercooling on the Nature of the Graphite Pattern in Gray Cast Iron," by Prof. R. Schneidewind and C. D. D'Amico, University of Michigan, was presented by Dr. Schneidewind.

Victor Zang, Unitcast Corp., Toledo, Ohio, presided at the afternoon session on steel castings, at which James Corfield, Michigan Steel Castings Co., Detroit, discussed high alloyed heat and corrosion resistant castings. The use of the spectrograph as a foundry tool for rapid chemical analysis and for the determination of small amounts of elements not normally determined in routine chemical analysis, was discussed by A. M. Sampson, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich. The final paper of this

AMERICAN FOUNDRYMAN

Speakers at the Fall Technical Conference. Left to Right—Top Row: Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, Ohio; R. G. McElwee, Vanadium Corp. of America, Detroit; A. M. Sampson, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.; James Corfield, Michigan Steel Castings Co., Detroit; Dr. D. W. Murphy, University of Michigan. Bottom Row: James H. Lansing, Malleable Founders Society, Cleveland; A. B. Kinzel, Union Carbide & Carbon Corp., New York; J. A. Dow, Holcroft & Co., Detroit; V. A. Crosby, Climax Molybdenum Co., Detroit, and L. W. Kempf, Aluminum Co. of America, Cleveland. R. H. McCarroll, Ford Motor Co., picture will be found on page 6 of this issue. The other absentee is Dr. Richard Schneidewind, University of Michigan, to whom we are indebted for these pictures.



session was one on "Cast Steels in Automotive Work" by R. H. McCarroll, Ford Motor Co., Detroit, presented on pages 2 to 6.

On Friday evening, the conference dinner was held. The committee was fortunate in having W. J. Cameron, Ford Motor Co., Detroit, as the principal speaker. Mr. Cameron gave an inspiring address on the part the technical man has played, now is playing and will play in the future development of our country. A. E. White, director, Department of Engineering Research, University of Michigan, acted as toastmaster. Prior to Mr. Cammeron's address, he introduced the members of the committee which staged the conference, and called on Prof. A. H. White, head, Department

of Chemical Engineering, and Prof. O. W. Boston, head, Department of Metal Processing.

A second session on cast iron was held Saturday morning, Sept. 17. In the absence of A. L. Boegehold, General Motors Corp., Detroit, due to illness Fred J. Walls, International Nickel Co., Detroit, presided. The first paper, devoted to a discussion of some factors which affect the properties of superheated cast iron, was presented by Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, Ohio. R. G. McElwee, Vanadium Corp. of America, Detroit, presented the second paper, which dealt with the influence of composition on the properties of electric furnace irons.

Successful Second Regional Foundry Conference Held By St. Louis Chapter

THE second annual regional foundry conference, held under the auspices of the St. Louis Chapter, Friday and Saturday, October 7 and 8, at the Missouri School of Mines and Metallurgy, Rolla, Mo., more than met the expectations of the 150 foundrymen in attendance.

The conference committee, co-operating with Professor C. Y. Clayton of the School of Mines, had arranged a program of great interest. The committee was headed by L. J. Desparois, Pickands-Mather & Co., the other members being G. S. Haley, Century Foundry Co.; G. W. Mitsch, American Car & Foundry Co.; C. R. Culling, Carondelet Foundry Co.; Webb Kammerer, Midvale Mining & Mfg. Co.; J. W. Kelin, secretary, St. Louis Chapter and assistant sales manager, Federated Metals Division, American Smelting & Refining Co.; Geo. E. Mellow, Liberty Foundry Co.; W. C. Bliss, Scullin Steel Co.; R. K. Durkan, M. W. Warren Coke Co., and J. O. Klein, Southern Malleable Co., chairman of the Chapter.

A feature of the conference was the session arranged for the entire student body, at which talks were given by C. R. Cull-

ing and J. H. Lansing, discussing some of the outstanding developments in cast metals, and the place of the engineering graduate in the foundry industry.

Another feature of the conference was the annual dinner, the high spot of which was the account presented by L. P. Robinson, chairman, Northeastern Ohio Chapter, of his experiences in operating a poultry farm in Michigan.

An outstanding session of the conference was that on cupola practice. With Geo. W. Mitsch presiding, M. J. Gregory, Caterpillar Tractor Co., Peoria, gave a most interesting account of the practice followed in his plant by mechanically charging a cupola. This talk was followed by one on operation of the hot blast cupola, as presented by A. O. Nilles, Griffin Wheel Co., Kansas City.

J. O. Klein, chairman of the St. Louis Chapter, presided at a session covering malleable and non-ferrous practices. Leon Wise, Chicago Malleable Castings Co., Chicago, and chairman, Research and Development Committee, Malleable Founders' Society, reviewed the fields of ap-

plication of malleable iron. H. Bornstein, past president and director, A. F. A., and director of laboratories, Deere & Co., Moline, in his talk on "Short Cycle Anneal" brought out data which provoked an interesting discussion. J. W. Klein gave a review of some of the factors involved in choosing and using non-ferrous alloys.

At the beginning of the Friday afternoon session, with L. C. Farquhar, American Steel Foundries, in the chair, Director Chedsey of the School of Mines, welcomed the members of the Chapter, expressing the hope that the conference could be maintained as an annual affair. The meeting was then continued with Horace Deane, Deere & Co., Moline, giving a very complete discussion of molding sand problems, and Harry Dietert demonstrating sand control equipment and explaining causes of defects due to sand. The last paper of this session was presented by M. C. Booze, Chas. Taylor Sons Co., covering limitations of refractories for foundry use.

Saturday morning was devoted to two sessions, one on gray iron metallography, the other on steel foundry problems. The chairman of the metallography session, C. R. Culling, introduced as the first speaker Professor S. R. B. Cook, Missouri School of Mines, who gave a readily understandable explanation of the use of the spectrograph in the analysis of metals, mentioning some of the limitations of this method. He was followed by Carl H. Morken, Carondelet Foundry Co., who presented a discussion of the practical applications of metallography in foundries. Steel foundry troubles were taken up in a discussion at a session, with W. Carter Bliss, Scullin Steel Co., presiding. Joseph D. Walsh, Scullin Steel Co., outlined the many causes of blow holes, other than metal causes, giving his views as to sources and remedies.

The final paper was presented by L. E. Everett, Key Co., East St. Louis, Ill., and vice chairman of the Chapter.

Complete Cornell Conference Program

PROGRAM for the Cornell Foundry Conference to be held at Cornell University, Ithaca, N. Y., Nov. 25 and 26, under the joint sponsorship of the Buffalo Chapter of the American Foundrymen's Association, Syracuse Foundrymen's Association and Cornell University, has been completed. All sessions will be held at Willard Straight Hall on the Cornell campus where sessions were held last year. Those who attended the conference in 1937 agree that the accommodations for the conference are ideal. Tentative program for the conference is as follows:

Registration, Thursday, November 24, and Friday, November 25, Willard Straight Hall, Cornell University Campus.

Friday, November 25

9:00 AM Opening Meeting.

R. E. Kennedy, American Foundrymen's Association.
Address of Welcome: Dean S. C. Hollister, College of Engineering, Cornell University.

9:30 AM Malleable Iron.

Chairman: Ralph T. Rycroft, vice president, Jewell Alloy & Malleable Co., Buffalo, N. Y.
Speaker: W. J. Diederichs, metallurgist, Autocar Co., Ardmore, Pa.

10:30 AM Gates and Risers.

Chairman: Willard Rother, Buffalo Foundry & Machine Co., Buffalo, N. Y.
Speaker: Pat Dwyer, engineering editor, *The Foundry*, Cleveland, Ohio.

12:30 PM Luncheon.

Speaker: Dexter S. Kimball, dean emeritus, College of Engineering, Cornell University.

2:00 PM Dust Hazards.

Chairman: Elliot Armstrong, Inter-Allied Foundries of New York State, Buffalo, N. Y.
Speakers: Dr. Leonard Greenburg, executive director, Division of Industrial Hygiene, State Department of Labor, New York City.
E. O. Jones, Director of Safety and Hygiene, American Foundrymen's Association.

4:00 PM Cupola Practice.

Chairman: M. W. Pohlman, president, Pohlman Foundry Co., Buffalo, N. Y.
Speaker: Donald J. Reese, International Nickel Co., New York City.

7:00 PM Conference Banquet.

Toastmaster: Marshall Post, president, American Foundrymen's Association.
Speaker: J. A. Voss, director of public relations, Republic Steel Corp., Buffalo, N. Y.

Saturday, November 26

9:00 AM Steel Castings.

Chairman: T. H. Burke, Otis Elevator Co., Buffalo, N. Y.
Speaker: K. V. Wheeler, Lebanon Steel Foundry Co., Lebanon, Pa.

10:30 AM Practical Sand Control Problems.

Chairman: Dr. H. Ries, geology department, Cornell University.

Speaker: H. W. Dietert, president, H. W. Dietert Co., Detroit, Mich.

12:30 PM Luncheon.

Speaker: Lyman P. Wilson, professor of law, Cornell University Law School.

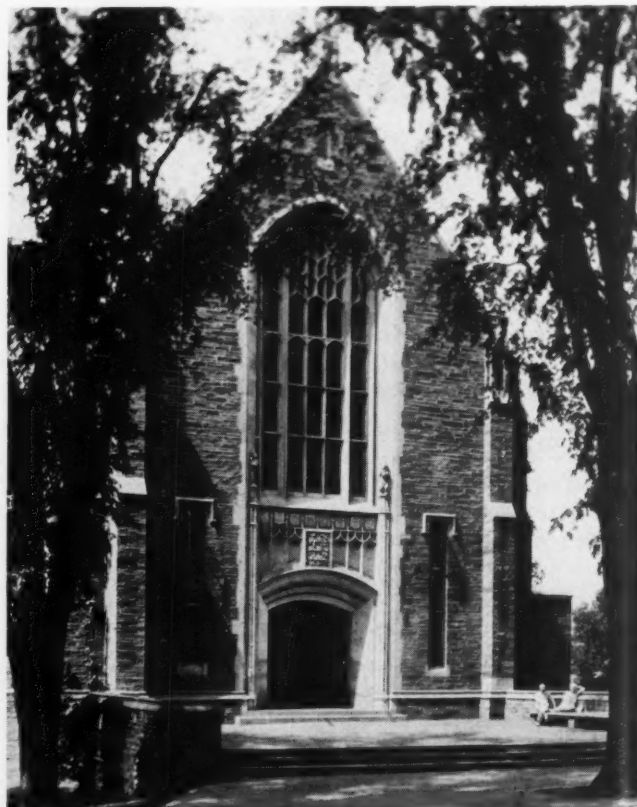
2:00 PM Elementary Metallurgy.

Chairman: H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y.

Speaker: H. C. Waldron, assistant foundry superintendent and metallurgist, Nordberg Mfg. Co., Milwaukee, Wis.

Demonstration of Metal Crystallization: Dr. C. W. Mason, chemistry department, Cornell University.

The committee in charge of arrangements for the conference is as follows: *Chairman*—H. B. Hanley, American Laundry Machinery Co., Rochester, N. Y.; M. W. Pohlman, Pohlman Foundry Co., Buffalo, and R. K. Glass, Republic Steel Corp., Buffalo, representing the Buffalo Chapter; H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y., and J. L. Loneran, Morris Machine Works, Baldwinsville, N. Y., representing the Syracuse Foundrymen's Association; and Prof. A. C. Davis, Department of Experimental Engineering, Sibley School of Mechanical Engineering, Cornell University, Ithaca, N. Y., representing the university.



Entrance to Willard Straight Hall, Cornell University, Ithaca, N. Y., Where Conference Sessions Will Be Held.

AMERICAN FOUNDRYMAN

Chapter Directory



Chicago Chapter

Meetings—2nd Monday, monthly, Medinah Club of Chicago.

Chairman—L. H. Rudesill, Griffin Wheel Co.
Vice-Chairman—C. E. Westover, Burnside Steel Foundry Co.

Treasurer—C. C. Kavin, Chas. C. Kavin Co.
Secretary—L. L. Henkel, Interlake Iron Corp.
Directors—H. Kenneth Briggs, Western Foundry Co.

J. D. Burlie, Western Electric Co.

J. J. Fox, Wisconsin Steel Co.

A. W. Gregg, Whiting Corp., Harvey, Ill.

H. W. Johnson, Greenlee Foundry Co.

W. C. Packard, National Engineering Co.

W. H. Parker, American Steel Foundries, East Chicago, Ind.

G. P. Phillips, International Harvester Co.

C. O. Thieme, H. Kramer & Co. James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind.

A. W. Weston, Chicago Hardware Foundry Co., North Chicago, Ill.

L. J. Wise, Chicago Malleable Castings Co.

Northeastern Ohio Chapter

Meetings—2nd Thursday, monthly, Cleveland Club, Cleveland.

Chairman—L. P. Robinson, Werner G. Smith Co.

Vice-Chairman—Charles Seelbach, Forest City Foundries Co.

Treasurer—R. F. Lincoln, Osborn Mfg. Co.

Secretary—J. H. Tressler, Hickman Williams Co.

Directors—Homer Britton, Cleveland Cooperative Stove Co.

F. R. Fleig, Smith Facing & Supply Co.

E. F. Hess, Ohio Injector Co., Wadsworth.

D. J. McAvoy, Grabler Mfg. Co.

B. G. Parker, Youngstown Foundry & Machine Co., Youngstown.

Marcel Reymann, Atlantic Foundry Co., Akron.

S. P. Schloss, Superior Foundry Co.

Frank G. Steinebach, The Foundry.

Fred A. Stewart, National Malleable & Steel Castings Co.

Quad City Chapter

Meetings—3rd Monday, monthly, rotate between Davenport, Iowa; Moline, East Moline and Rock Island, Ill.

Chairman—M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.

Vice-Chairman—H. A. Deane, Deere & Co., Moline, Ill.

Secretary-Treasurer—J. Morgan Johnson, Tri-City Mfrs. Assn., Moline, Ill.

Directors—P. T. Bancroft, Moline, Ill.

H. Bornstein, Deere & Co., Moline, Ill.

C. H. Burgston, Deere & Co., Moline, Ill.

T. J. Frank, Frank Foundries Corp., Davenport, Iowa.

F. O. Gorman, John Deere Spreader Works, E. Moline, Ill.

A. E. Hageboeck, Frank Foundries Corp., Moline, Ill.

H. F. Henninger, International Harvester Co., Rock Island, Ill.

John H. Ploehn, French & Hecht, Inc., Davenport, Iowa.

W. O. McFatridge, International Harvester Co., Rock Island, Ill.

Detroit Chapter

Meetings—3rd Thursday, monthly, Fort Shelby Hotel, Detroit.

Chairman—Ira F. Cheney, Griffin Wheel Co.

Vice-Chairman—Harry W. Dietert, H. W. Dietert Co.

Secretary—Harry J. Deutsch, Aluminum Co. of America.

Treasurer—Wm. W. Bowring, F. B. Stevens, Inc.

Directors—Glenn Coley, Detroit Edison Co.

R. B. Crawford, Atlas Foundry Co.

J. H. Crawley, Pontiac Motor Co.

L. G. Korte, Atlas Foundry Co.

D. J. Meloche, American Radiator Co.

J. D. Stoddard, Detroit Testing Laboratory.

St. Louis District Chapter

Meetings—2nd Thursday, monthly, St. Louis.

Chairman—J. O. Klein, Southern Malleable Iron Co.

Vice-Chairman—Lee Everett, The Key Co.

Secretary-Treasurer—J. W. Kelin, Federated Metals Div., American Smelting & Refining Corp.

Directors—M. A. Bell, M. A. Bell Co.

O. J. Belzer, Banner Iron Works.

L. J. Desparois, Pickands Mather & Co.

G. S. Haley, Century Foundry Co.

G. W. Mitsch, American Car & Foundry Co.

L. Reiber, United Collieries, Inc.

Metropolitan Philadelphia Chapter

Meetings—2nd Friday, monthly, Engineers' Club, Philadelphia.

Chairman—H. L. Henszey, The Carborundum Co., Philadelphia.

Vice-Chairman—W. C. Hartmann, Bethlehem Steel Co., Bethlehem, Pa.

Secretary-Treasurer—W. B. Coleman, W. B. Coleman & Co., 1920 W. Indiana Ave., Philadelphia.

Directors—C. A. Bever, Bethlehem Steel Co., Bethlehem, Pa.

J. T. Fegley, North Bros. Mfg. Co.

G. L. Coppage, Pusey & Jones Corp., Wilmington, Del.

L. W. Harris, Link-Belt Co.

R. J. Keeley, Ajax Metal Co.

John H. S. Spencer, H. W. Butterworth & Sons Co., Bethayres, Mont. Co., Pa.

Wisconsin Chapter

Meetings—3rd Friday, monthly, Schroeder Hotel, Milwaukee.

Chairman—Roy M. Jacobs, Standard Brass Works.

Vice-Chairman—Wm. J. McNeill, Federal Malleable Iron Co.

Treasurer—Wm. J. Donnelly, Smith Steel Foundry Co.

Secretary—B. D. Claffey, General Malleable Corp., Waukesha.

Directors—H. R. Donald, Interstate Supply & Equipment Co.

Ray Flansburg, Belle City Malleable Iron Co., Racine.

A. F. Genthe, Harnischfeger Corp.

Walter Gerlinger, Walter Gerlinger, Inc.

R. J. Kelly, American Skein & Foundry Co.

R. S. MacPherran, Allis-Chalmers Mfg. Co.

A. C. Ziebell, Universal Foundry Co., Oshkosh.

Northern California Chapter

Meetings—2nd Friday, monthly.

Chairman—John D. Fenstermacher, Columbia Steel Co.

Vice-Chairman—S. D. Russell, Phoenix Iron Works, Oakland.

Secretary-Treasurer—G. L. Kennard, San Francisco.

Directors—J. K. Benedict, H. C. Donaldson & Co., San Francisco.

F. C. Holman, Tuolumne Foundry & Machine Works, Sonoma.

I. L. Johnson, Pacific Steel Casting Co., Berkley.

H. L. Martin, Vulcan Foundry Co., Oakland.

M. M. Morison, Balfour, Guthrie & Co., Ltd., San Francisco.

R. E. Noack, Monarch Foundry & Engineering Corp., Stockton.

W. A. Schimmelpfennig, California Foundries, Inc., Oakland.

M. G. Wilson, Wilson & Nutwell, Fresno.

Birmingham District Chapter

Meetings—3rd Friday, monthly, Tutwiler Hotel, Birmingham.

Chairman—C. B. Saunders, Tennessee Coal, Iron & R. R. Co.

Vice-Chairman—R. C. Harrell, Stockham Pipe Fittings Co.

Secretary-Treasurer—W. O. McMahon, Sloss-Sheffield Steel & Iron Co.

Directors—J. M. Franklin, Central Foundry Co.

C. A. Hamilton, Alabama Pipe Co.

J. E. Reynolds, U. S. Pipe & Foundry Co.

W. L. Roueche, Sr., McWane Cast Iron Pipe Co.

L. N. Shannon, Stockham Pipe Fittings Co.

Buffalo Chapter

Meetings—1st Monday, monthly, King Arthur's Restaurant, Buffalo.
Chairman—M. W. Pohlman, Pohlman Foundry Co., Inc.
Vice-Chairman—W. J. Corbett, Atlas Steel Casting Co.
Treasurer—R. K. Glass, Republic Steel Corp.
Secretary—J. R. Wark, Queen City Sand & Supply Co.
Directors—J. P. Begley, Pratt & Letchworth Co., Inc.
T. H. Burke, Otis Elevator Co.
J. McCallum, McCallum-Hatch Bronze Co.
V. M. Mazurie, Buffalo Foundry & Machine Co.
W. S. Miller, Chas. C. Kavin Co.
Lynn Reynolds, Worthington Pump & Machinery Co.
R. T. Rycroft, Jewell Alloy & Malleable Co., Inc.

Southern California Chapter

Meetings—4th Thursday, monthly.
Chairman—J. G. Coffman, Los Angeles Steel Castings Co., Los Angeles.
Vice Chairman—Bert Oldfield, Alhambra Foundry Co., Alhambra.
Secretary—M. S. Robb, Bethlehem Steel Co., Los Angeles.
Treasurer—Chas. Gregg, Reliance Regulator Co., Alhambra.
Directors—Earl Anderson, Enterprise Foundry Co., Los Angeles.
E. F. Green, Axelson Mfg. Co., Los Angeles.
Wm. Feltes, Westelectric Castings, Inc., Los Angeles.
Robert Gregg, Reliance Regulator Co., Alhambra.
S. R. Kimberly, Los Angeles Steel Casting Co., Los Angeles.
D. E. Lingenfelter, Quality Foundry Co., Los Angeles.
G. W. Merrefield, Kay-Brunner Steel Products Co., Los Angeles.
J. H. Wilkins, Dayton & Waldrip Co., Los Angeles.
J. E. Wilson, Climax Molybdenum Co., Los Angeles.

Metropolitan New York-New Jersey Chapter

Meetings—1st Monday, monthly, Essex House, Newark, N. J.
Chairman—D. J. Reese, International Nickel Co., New York.
Vice-Chairman—W. E. Day, International Motor Co., New Brunswick, N. J.
Secretary—T. J. Wood, Robins Conveying Belt Co., Passaic, N. J.
Treasurer—Samuel Frankel, H. Kramer Co., New York, N. Y.
Directors—R. J. Allen, Worthington Pump Co., Harrison, N. J.
R. E. Nesbitt, Pratt Institute, Brooklyn, N. Y.
W. A. Phair, Iron Age, New York, N. Y.
J. W. Reid, Robins Conveying Belt Co., Passaic, N. J.
Sam Tour, Lucius Pitkin, Inc., New York, N. Y.

Northern Illinois and Southern Wisconsin Chapter

Chairman—John Clausen, Greenlee Bros. & Co., Rockford, Ill.
Vice-Chairman—G. J. Landstrom, Sundstrand Machine Tool Co., Rockford, Ill.
Technical Secretary—H. C. Winte, Fairbanks, Morse & Co., Beloit, Wis.
Secretary-Treasurer—G. K. Minert, Gunitite Foundries Corp., Rockford, Ill.
Directors—August Christen, Arcade Mfg. Co., Freeport, Ill.
C. M. Dale, Liberty Foundries Co., Rockford, Ill.
W. L. Davy, W. L. Davy Pump Co., Rockford, Ill.
W. E. Goff, J. I. Case Co., Rockford, Ill.
H. F. Halverson, Beloit Foundry Co., Beloit, Wis.
Eli Johnson, Greenlee Bros & Co., Rockford, Ill.
P. A. Paulson, Gunitite Foundries Corp., Rockford, Ill.
A. W. Wiegart, Geo. D. Roper Corp., Rockford, Ill.
George Zabel, Fairbanks, Morse & Co., Beloit, Wis.

Ontario Chapter

Chairman—Joseph Sully, Sully Brass Fdry., Ltd., Toronto.
Vice-Chairman—D. J. Macdonald, Dominion Radiator & Boiler Co., Toronto.
Secretary-Treasurer—S. R. Francis, Metals & Alloys, Ltd., Toronto.
Directors—W. R. Barnes, Wm. R. Barnes Co., Ltd., Hamilton.
D. Cameron, John T. Hepburn, Ltd., Toronto.
N. B. Clarke, Steel Co. of Canada, Ltd., Hamilton.
O. W. Ellis, Ontario Research Foundation, Toronto.
C. H. Ley, Dominion Wheel & Fdries, Ltd., Toronto.
C. C. Macdonald, Frederic B. Stevens Co. of Canada, Ltd., Toronto.
J. J. McFadyen, Galt Malleable Iron Co., Ltd., Galt.
D. M. Storie, Fittings, Ltd., Oshawa.

Canadian Section

Chairman—Jos. Sully, Sully Brass Foundry, Ltd., Toronto.
Vice-Chairman—H. J. Roast, Canadian Bronze Co., Montreal.
Secretary-Treasurer—D. J. McDonald, Dominion Radiator & Boiler Co., Ltd., Toronto.
Directors—Maj. L. L. Anthes, Anthes Foundry, Ltd., Toronto.
Emil Drolet, La Campagnie, F. X., Drolet, Quebec, P. Q.
O. W. Ellis, Ontario Research Foundation, Toronto.
W. C. Fletcher, Canadian Car & Foundry Co., Ltd., Montreal.
J. T. Hepburn, John T. Hepburn, Ltd., Toronto.
J. S. Hoyt, T. McAvity & Sons, Ltd., St. John.
A. C. Neal, Enamel & Heating Products, Ltd., Sackville, N. B.
Frank A. Sherman, Dominion Foundries & Steel, Ltd., Hamilton, Ontario.
A. G. Storie, Fittings, Ltd., Oshawa, Ontario.

November Chapter Meetings

November 7

Metropolitan New York-New Jersey
Essex House, Newark, N. J.
E. C. HOENICKE—"Permanent Mold Cast Iron Castings"
Buffalo
King Arthur's Restaurant
R. G. McELWEE—"Alloy Cast Iron"

November 8

Northern Illinois-Southern Wisconsin
Hotel Freeport, Freeport, Ill.
WM. J. GREDE—"Foundry Cost Methods for Gray Iron Foundries"

November 10

Northeastern Ohio
Cleveland Club, Cleveland
G. S. EVANS—"Refining Cast Iron"
St. Louis
MOVIE—"Making of Steel"
Round-table on Rolla Conference

November 11

Metropolitan Philadelphia
Engineer's Club, Philadelphia
"Casting Aluminum and Aluminum Alloys"

Northern California
Hotel Whitcomb, San Francisco

November 14

Chicago
Medinah Club, Chicago
"Steel—Man's Servant"
Technicolor Film

November 17

Detroit
Fort Shelby Hotel, Detroit
MARSHALL POST—"Cement Molding Process Developments"
Southern California
Clark Hotel, Los Angeles

November 18

Birmingham District
Tutwiler Hotel, Birmingham
W. F. PIPER—"Foundries Around the World"
Wisconsin
Schroeder Hotel, Milwaukee
MARSHALL POST—"Cement Molding Process Developments"

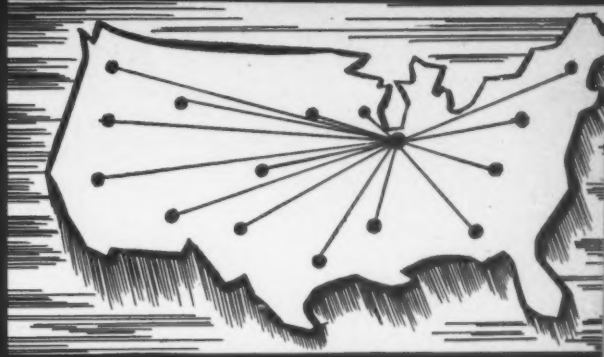
November 21

Quad City
Ft. Armstrong Hotel, Rock Island, Ill.
MARSHALL POST—"Cement Molding Process Developments"

November 25

Ontario
Hamilton, Ontario
W. F. PIPER—"Foundries Around the World"

Chapter Activities



Northern Illinois-Southern Wisconsin Group Hold First Meeting as Chapter

By H. C. Winte*, Beloit, Wis.

THE Northern Illinois-Southern Wisconsin Chapter of A.F.A., formerly the Northern Illinois Foundrymen's Association, officially became the "baby" Chapter of the American Foundrymen's Association at its first meeting, on Sept. 13, at the Faust Hotel, Rockford, Ill.

Following the dinner, Chapter Chairman John Clausen, Greenlee Bros. & Co., Rockford, introduced A.F.A. Technical Secretary Norm Hindle, who briefly described the benefits of Chapter affiliation and presented the Chapter with the T.B.B.B.R. (designation by the Southern California Chapter), better known as the "Traveling Ball-Bearing Baby Rattle," amid

cheers and laughter.

Following the report of Chapter Secretary-Treasurer G. K. Minert, Gunitite Foundries Corp., Rockford, Chairman Clausen introduced the speaker of the evening, G. S. Evans, Mathieson Alkali Works, Inc., New York, who spoke on the use of fused soda ash as a desulphurizing

agent. In his talk, Mr. Evans pointed out that fused soda ash could be used either in the ladle or in the cupola charge. He discussed such points as the amounts required to secure given sulphur content reduction, time necessary for reactions to take place, improper handling and methods of introduction. The speaker pointed out that fused soda ash is being used by many steel companies for desulphurization purposes.

A lively discussion period followed the talk.

Newly-Formed Ontario Chapter Holds First Meeting

By G. L. White*, Toronto, Canada

GOOD attendance marked the first meeting of the newly-formed Ontario Chapter of A.F.A. at Rock Garden Lodge, Hamilton, September 30. Mes-

sages of congratulation were received from A.F.A. Headquarters and from several other sources.

L. P. Robinson, director of core oil sales, The Werner G. G. Smith Co., Cleveland, and Chairman of the Northeastern Ohio Chapter of A.F.A., was the speaker of the evening. Twenty-three years in core oil sales have given him ample opportunity to study his subject, "Some Sources of Core Room Troubles."

Nine important factors entering into core room operation which must be controlled properly if the best results are to be obtained are: (1) Proper selection of core sands, (2) proper selection of binders, (3) use of cereal binders, (4) proper ratios, (5) proper mixing, (6) moisture control, (7) baking, (8) venting, (9) proper inspection. The speaker considered each of these factors briefly.

According to the speaker, there is one proper sand for every core job and, even at a comparatively high price, it usu-

*Fairbanks, Morse & Co., and Technical Secretary, Northern Illinois-Southern Wisconsin Chapter.

*Canadian Metals & Metallurgical Industries and official reporter, Ontario Chapter.



Officers and Directors of the Northern Illinois-Southern Wisconsin Chapter at First Meeting of the Group as a Chapter of A. F. A. Left to Right—Sitting: H. C. Winte, Fairbanks Morse & Co., Beloit, Wis., Chapter Technical Secretary; G. K. Minert, Gunitite Foundries Corp., Rockford, Ill., Chapter Secretary-Treasurer; John Clausen, Greenlee Bros. & Co., Rockford, Ill., Chapter Chairman; G. S. Evans, Mathieson Alkali Works, Inc., New York, the Speaker; G. J. Landstrom, Sundstrand Machine Tool Co., Rockford, Ill., Chapter Vice Chairman. Standing: J. J. Fox, Wisconsin Steel Co., Chicago, Chicago Chapter Representative; C. M. Dale, Liberty Foundries Co., Rockford, Ill., Director; W. E. Goff, J. I. Case Co., Rockford, Ill., Director; Eli Johnson, Greenlee Bros. & Co., Rockford, Ill., Director; N. F. Hindle, Technical Secretary, American Foundrymen's Association, Chicago; A. H. Putnam, Rock Island, Ill., Consulting Metallurgist; W. F. Pfanstiel, W. F. & John Barnes Co., Rockford, Ill.



ally results in real savings in core room costs. The right sand permits the use of the highest possible sand-oil ratio, the cores clean out better and sticking in the boxes is eliminated.

No single binder provides the answer to all problems in core manufacture. Core oil is used quite generally under modern conditions of intricate production, but some dry binders give good results. Compared with linseed oil, core oils generally work better in the boxes, bake faster and create less gas and smoke.

Properly used, cereal binders give green bond strength, which is valuable in the transfer of the core from the bench to the oven. Only that amount should be used which gives the required green bond strength and finish. Few foundries know their ratio of sand to oil with sufficient accuracy. Ratios should be stated definitely in terms of amounts of sand and quarts of oil.

Best mixing is obtained with paddle or muller type mixers, although other methods may have to be employed in some instances. These more effective mixers usually save about 10 per cent on oil, as compared to the

poorer methods. Preference is well divided between paddle and muller types. Where a lot of cereal binder is used, the muller generally is preferred. There is an optimum time of mixing for a sand which should be observed.

Core room troubles often may be traced to high moisture content in the sand. Some type of equipment, which need not be expensive, should be installed to dry core sand before use. Every core baking oven should have accurate temperature measurement, and the temperature preferably should be recorded to give a check on the furnace operator. Baking need not be a variable factor, but it frequently is, through lack of instruments or neglect of those that are installed.

The chief point to watch in venting is that the vents in the core are taken off through the mold. If there is proper inspection, castings will never be lost through faulty cores. All imperfect cores should be thrown out and never allowed to reach the mold.

Following the address, there was a short discussion period in which some of the information included in this review was brought out.

Chicago Chapter Holds Picnic

APPROXIMATELY 750 members and guests attended the Chicago Chapter stag picnic Sept. 24, at the Lincolnshire Country Club, Crete, Ill. The program included golf, horse shoes, a soft ball game between two girl teams, and a stag dinner and floor show in the evening. The credit for the grand success that it was, is due to the Entertainment Committee whose Personnel consisted of J. H. Abbott, Hickman, Williams & Co., *Chairman*; B. J. Aamodt, National Malleable & Steel Castings Co.; W. E. Brewster, Wisconsin Steel Co.; H. A. Forsberg, Continental Roll and Steel

Foundry Co.; D. N. Gellert, Nichol-Straight Foundry Co.; J. G. Gore, Werner G. Smith Co.; A. W. Gregg, Whiting Corp.; H. F. Henninger, International Harvester Co.; W. C. Hitchins, Pyle National Co.; H. B. Hoge, Western Foundry Co.; H. W. Johnson, North Western Foundry Co.; E. Longenbeck, American Manganese Steel Co.; T. J. Magnuson, J. S. McCormick Co.; P. V. Martin, Carnegie-Illinois Steel Co.; H. W. Maack, Crane Co.; O. C. Olson, S. Obermayer Co.; H. E. Orr, Burnside Steel Foundry Co.; J. H. Owen, Harbison-Walker Refractories Co.; W. C. Packard, National Engineering Co.; W. A. Parker, American Steel Foundries; H. J. Sprecken, Jr., International Harvester Co.

The illustrations at the left show scenes at the Chicago Chapter picnic.

AMERICAN FOUNDRYMAN

Management Problems Discussed at Wisconsin Chapter Meeting

By B. D. Claffey*, Waukesha, Wis.

THE regular monthly meeting of the Wisconsin Chapter was held Sept. 16 at the Schroeder Hotel, Milwaukee, with Chapter Chairman Roy Jacobs, Standard Brass Works, presiding. Following reports of B. D. Claffey, chairman of the Golf Committee, and A. C.

*General Malleable Corp., and Secretary, Wisconsin Chapter.

Ziebel, Universal Foundry Co., Oshkosh, Wis., chairman of the program committee, the meeting was addressed by Chas. W. Pendock, president, Le Roi Co., Milwaukee. Mr. Pendock spoke on "Streamlining Management," which was a very practical discussion of job evaluation in the shop and the elimination of management resistance.

Sands and Gating Interest

Buffalo Chapter

By J. R. Wark*, Buffalo, N. Y.

SEPT. 12 was the date of the first meeting of the Buffalo Chapter this season. The meeting was held in King Arthur's Restaurant, Buffalo, with W. J. Corbett, Atlas Steel Casting Co., Chapter Vice Chairman, presiding. The first speaker on the program was Police Commissioner G. H. McClellan of Buffalo, who outlined what was being done and what was being accomplished to prevent and reduce crime in his city.

N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio, was the second speaker and talked on "Synthetic Sands." Mr. Dunbeck compared natural and synthetic sands and explained that each had its place in the foundry, depending on the class of work being made. The speaker explained the advantages and disadvantages of both types of sand, told how best to use various clay bonds and discussed mixtures, moisture contents, cleaning costs and storage.

At the opening of the meeting, acting Chairman Corbett announced the death of A. Lockwood, Lumen Bearing Co., a director of the Chapter, and those present rose and stood in silence in his memory. The chairman then introduced John McCallum, president, McCallum-Hatch Bronze Co., Buffalo,

elected a director to fill the vacancy. Following the report of Chapter Treasurer R. K. Glass, Republic Steel Corp., acting Chairman Corbett announced

Northern California

Chapter Discusses Taxes

By G. L. Kennard*, San Francisco, Calif.

MOVIES and a discussion of the California State constitutional amendment on single tax were subjects which featured the first meeting this season of the Northern California Chapter of A.F.A. The meeting was held

*Secretary-Treasurer, Northern California Chapter.

the second annual regional conference sponsored jointly by the Buffalo Chapter, Cornell University and the Syracuse Foundrymen's Association, to be held at Cornell University, Ithaca, N. Y., Nov. 25 and 26.

The second meeting of the Chapter was held in the same place with Chapter Chairman M. W. Pohlman, Pohlman Foundry Co., presiding. The Chapter had as its guests S. R. Francis, Metals & Alloys, Ltd., Toronto, and Secretary-Treasurer of the newly formed Ontario Chapter, and Mr. Reppin of St. Catharines, Ont.

Mr. Soley, patent attorney, Carborundum Co., Niagara Falls, N. Y., gave an interesting and humorous coffee talk on "Freak Patents." Following the coffee talk, Chairman Pohlman introduced Pat Dwyer, engineering editor, *The Foundry*, Cleveland, who gave an illustrated lecture on "Gates and Risers."

at the Athens Athletic Club, Oakland, with Chapter Chairman J. D. Fenstermacher, Columbia Steel Co., presiding. Wesley W. Kergan, attorney, San Francisco, in discussing the single tax amendment, was decidedly unfavorable to it. D. E. Hughes,



*Queen City Sand & Supply Co. and Secretary, Buffalo Chapter.

Crane Co., San Francisco, showed a film entitled "Flow" which depicted operations in the Chicago plant of his company.

The Northern California Chapter has gone on record, and, to quote our chairman, "will go out and do battle with any and all opposition to our declared intention of having the 1940 A.F.A. Convention and exhibit held in San Francisco."

Coming events planned for the Chapter include an outing on Oct. 21 which will feature golf, and a joint meeting with the Southern California Chapter in April, 1939.

Past President H. Bornstein, Deere & Co., Moline, visited the West Coast on business and while there was entertained at Cliff House, San Francisco, by a group of Northern California foundrymen. The accompanying illustration shows a number who attended the luncheon. *Left to*

right—H. L. Martin, Vulcan Foundry Co., Oakland; Jack Benedict, H. C. Donaldson & Co., San Francisco; Arthur Allen, San Francisco Stove Works, San Francisco; Harry Parrock; C. L. Henderson, H. C. Macauley Foundry Co., Berkley; Chas. J. P. Hoehn, Enterprise Foundry Co., San Francisco; J. D. Fenstermacher, Columbia Steel Co., San Francisco, and Chapter Chairman; Past President H. Bornstein, Deere & Co., Moline, Ill.; Walter Swanson; John Masterson; S. D. Russell, Phoenix Iron Works, Oakland, Chapter Vice Chairman; Ivan Johnson, Pacific Steel Casting Co., Berkley; Al Snow, Snow & Gilgiani, San Francisco. *Standing:* W. A. Schimmelpfennig, California Foundries, Inc., Berkley, and G. L. Kennard, Pacific Coast Founders Association, San Francisco, Chapter Secretary-Treasurer.

F. Haggman, Foundry Specialties Co., entertainment.

Chairman Gregg advised that his committee was making arrangements to have a foundry apprentice training course, meeting one or two nights per week, at Frank Wiggings Trade School and that the instructor probably would be an A. F. A. member with a foundry owner, superintendent or metallurgist as guest speaker at each meeting. Chairman Haggman of the entertainment committee reported that the annual picnic was a financial success. Chairman Coffman of the publicity committee reported that his committee would publish a loose-leaf directory of members of the Southern California Chapter soon.

In presenting the equipment night program, the following manufacturers cooperated: American Foundry Equipment Co., Mishawaka, Ind.; National Engineering Co., Chicago; Beardsley & Piper Co., Chicago. A. A. Grant, Grant & Co., presented an industrial motion picture illustrating American centrifugal blast cleaning equipment; E. C. Heyde, plant engineer, Washington Eljer Co., showed a motion picture entitled "Production Molding Equipment" for the Beardsley & Piper Company; G. W. Effinger, Snyder Foundry Supply Co., illustrated and spoke on the sand handling and conditioning equipment manufactured by the National company.

Fred A. Maurer, General Electric Co., Ontario, Cal., was discussion leader and the discussion which followed these presentations was so lively that a halt finally had to be called as the hour grew late.

Southern California Chapter Holds Equipment Night

By M. S. Robb*, Los Angeles, Calif.

THE first meeting of the season for the Southern California Chapter was held at the Clark Hotel, Los Angeles, Cal., on Sept. 29, with Chapter Chairman J. G. Coffman, Los Angeles Steel Castings Co., presiding. The first meeting was an equipment night with local representatives of foundry equipment manufacturers as speakers.

Prior to the technical part of the meeting, Robert Gregg, Reliance Regulator Corp., past chairman of the Chapter, was presented with an A. F. A. signet ring for his splendid work in organizing the Southern California Chapter and its grand success. In accepting the ring, Mr. Gregg stated that he had been an A. F. A. member for 19 years and that each year the technical papers and data that he had received through his membership, had become increasingly valuable.

Following the presentation, Chapter Chairman Coffman announced the appointment of the various committees for the coming year. The following committee chairmen then outlined the activities of their respective committees for the coming year: E. F. Green, Axelson Mfg. Co., membership; G. W. Merrefield, Kay-Brunner Steel Products, program; J. G. Coffman, publicity; Robert Gregg, education and apprentice training; and W.

Quad City Chapter Discusses Cupola Operation

By J. Morgan Johnson*, Moline, Ill.

THE first meeting of the 1938-39 season of the Quad City Chapter was held at the LeClair Hotel, Moline, Ill., Sept. 19 with Chapter Vice Chairman

Horace Deane, Deere & Co., Moline, presiding. Don Reese, International Nickel Co., New York and chairman of the Metropolitan New York-New Jersey Chapter, was the speaker. He talked on

*Bethlehem Steel Co. and Secretary Southern California Chapter

*Tri-City Manufacturers Association and Secretary-Treasurer, Quad City Chapter.

"Producing Quality Gray Iron Castings with a Cupola." The speaker developed his subject by first discussing the equipment available to the industry for melting cast iron and then described the various factors that should be taken into consideration in the construction of a cupola, the selection of cupola blowers and their successful operation. He also discussed composition of the charge, methods of charging, what takes place during the melting process in the cupola, moisture in the cupola blast and its control. Mr. Reese also discussed in detail many of the accessories used in control of cupola operation and explained their construction, types available and use.

Throughout his entire talk, the speaker used concrete examples to illustrate his points as to the effect of the various factors that he was discussing.

Prior to Mr. Reese's discussion, A. E. Hageboeck, Frank Foundries Corp., Moline, chairman of the attendance committee for the Iowa Foundry Conference, urged all plants to send men to the conference.

St. Louis Chapter Hears Talk on Safety

By J. W. Kelin*, St. Louis, Mo.

THE largest attendance of any meeting held by the St. Louis Chapter, A.F.A., was the outstanding feature of the meeting held Thursday evening, Sept. 15, at the Mark Twain Hotel. Almost 100 A.F.A. and A.S.M. members and friends were present at this joint A.S.M.-A.F.A. meeting—the first of the current year.

Harry Guilbert, director, safety and compensation, Pullman Co., Chicago, was the speaker of the evening. His talk, directed along the lines of safety in general as well as in the foundry, was most interesting, entertaining and helpful.

A brief review of the various committee and chapter activities had been previously given at the

business session and a cordial welcome extended to the many visitors as well as to the officers and members of the American Society of Metals.

Membership Committee Chairman R. Stifel took great pleasure in announcing that we had received four applications for membership during the evening from C. M. Adkinson, C. L. Clemans, Charles V. Sharritt, and A. C. Sheldon, all four being connected with the Key Co., E.

St. Louis, Ill. It was pointed out that it was rather unusual for any one company to have four of its employees join any chapter of the A.F.A. in one evening.

L. Desparois, Pickards Mather Co., chairman of the Rolla conference committee, presented the plans and program for the Rolla conference. Considerable interest was manifested by the membership in this forthcoming event.

Birmingham District Chapter Holds Annual Barbecue

By R. C. Harrell*, Birmingham, Ala.

THE Birmingham District Chapter held its annual barbecue Saturday, Sept. 17, at Pineview Beach, Ala. This outing was one of the best yet held by the local Chapter with 350 members and friends gathering on the beautiful grounds of the lake for an all-day jubilee.

At 9:00 A. M., the day started with a softball game. The feature of this game was the umpiring of Col. Karl Langrebe, Tennessee Coal, Iron and Railroad Company. After his demonstration of what a good umpire should be, there wasn't any need for the group to visit a vaude-

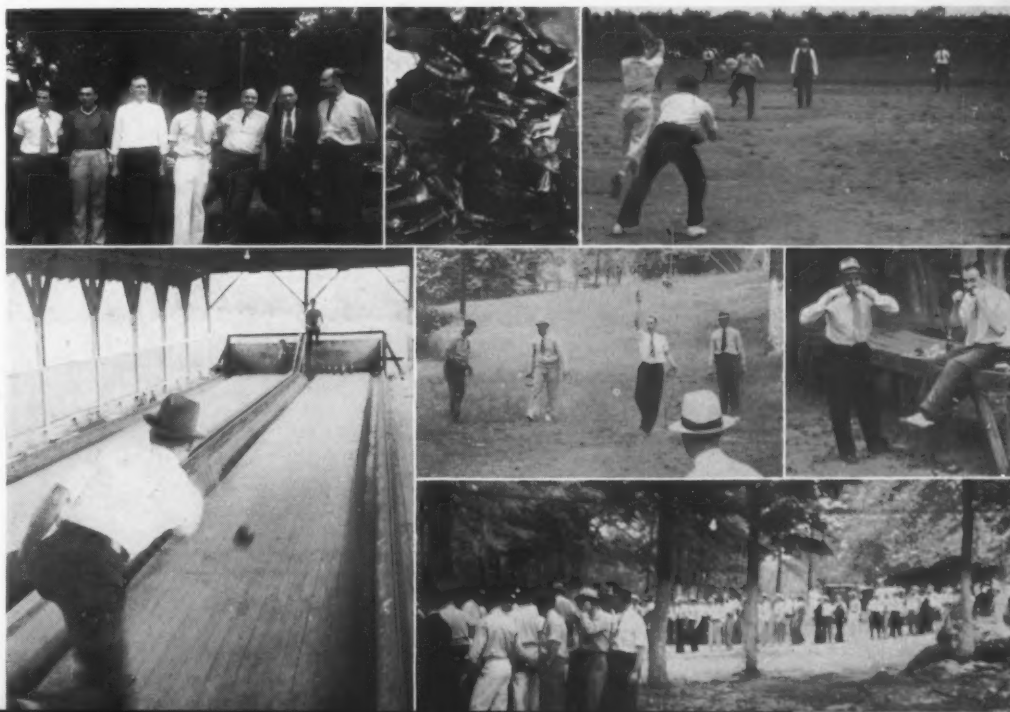
ville show in the near future.

Soon after the softball game, the overflow crowd took to the grand old game of horse-shoe pitching and no doubt champions in the rough were discovered. Bowling and volleyball took the attention of many of the guests. Although swimming season was over, Dr. J. T. McKenzie of Acipco braved the icy water of the lake and came out smiling.

At noon, an old-fashioned barbecue of southern chicken, spare-ribs and all the trimmings was served to the gathering. Many of the chapter's friends were guests at this outing and the fine fellowship shown repaid them for their visit.

*Stockham Pipe Fittings Co., Vice-Chairman, Birmingham District Chapter and Chairman, Barbecue Committee.

Events at Birmingham Chapter Outing. Left to Right—Top—The Committee; Eats; Baseball. Center—Horseshoes; How to Eat Southern Fried Chicken. Bottom—Bowling; Lineup for the Feed.



*Federated Metals Division, American Smelting & Refining Corp., and Secretary-Treasurer, St. Louis District Chapter.

FUNDAMENTAL FOUNDRY INFORMATION

Available in A. F. A. Publications

Testing and Grading Foundry Sands and Clays

208 pp., 6x9, (1938, Fourth Edition). Cloth Binding. Price \$4.00. Member's price \$2.00.

Standards and tentative standards for testing and grading foundry sands and clays adopted by the A.F.A., as prepared by the Committee on Foundry Sand Research. Covers sampling, test methods for permeability, strength, fineness, mold hardness, dye absorption, sintering, core properties, methods for chemical analyses, and grading classifications. Equipment described.

Tentative Code of Recommended Practices for Testing and Measuring Air Flow in Exhaust Systems (1937). Price \$1.00. Members' price, 50 cents.

Gives the general type of instruments and technique employed in determining volume and velocity of air flow in exhaust systems. Covers the application and testing technique for pitot tubes, inclined and vertical manometer gauges, revolving vane type anemometers and swinging vane type direct reading velocity meters. Thirteen accurate drawings depict the methods described.

Tentative Code of Recommended Practices for Grinding, Polishing and Buffing Equipment Sanitation (1937). Price \$1.00. Members' price, 50 cents.

Gives recommended practices for ventilation of grinding, polishing, buffing, scratch brushing or abrasive cutting-off wheels, grinding or polishing straps or belts. A series of definitions is followed by sections on applications for hood and branch pipe requirements, design of exhaust systems, testing exhaust systems, hood and enclosure design and data on air velocity required. Numerous illustrations will aid engineers to design effective equipment to meet plant requirements.

Tentative Recommended Good Practice Code and Handbook on Fundamentals of Design, Construction, Operation and Maintenance of Exhaust Systems (1938).

Price \$4.00. To members \$2.00.

Third of a series of codes for the control and abatement of occupational disease. Gives complete engineering information. The exhaust systems are detailed on an engineering basis. Will be useful in the purchase of new equipment or exhaust systems, and in the revision, to make more efficient, present systems. Shows how to do the job intended at a minimum cost. Research work performed in developing this code gives entirely new information and data on resistance losses of friction in straight pipes and elbows. Complete with almost 200 pages, including 35 charts and engineering diagrams. Appendix gives an example of an exhaust system completely worked out, step by step, showing the proper use of all rules and formulae given in text.

Standard Pattern Color Charts

Price 5 cents each in lots of 5 to 50. \$4.00 per 100.

Recommended colors for wood patterns and core boxes. Approved by Joint Committee and adopted by Division of Simplified Practice, Bureau of Standards. Includes color page suitable for displaying on bulletin board in pattern shop and foundry. Poster 17x11-in.

Pearlitic Malleable Cast Iron

An A.S.T.M. publication. 32 pp., 6x9, (1936). Price \$0.60; to A.F.A. and A.S.T.M. members \$0.35.

Compiled from various sources by a special committee of the A.S.T.M. Covers classification, producer's data on various classes and patent literature. Considered of much value to those interested because published data since 1923 is largely in patent papers.

Steel Castings (A.F.A.-A.S.T.M. Symposium).

Heavy paper binding, 254 pp., 6x9, (1932). Price \$1.00.

A compilation of ten papers giving critical information and data on the properties of practically all classes of steel castings. Includes data on methods of molding, casting, use of alloys and heat treatment. Design and specifications fully treated. Extensive discussion.

Steel Casting Design for the Engineer and the Foundryman, by C. W. Briggs, R. A. Gezelius and A. R. Donaldson.

Heavy paper binding, 68 pp., 6x9, (1938), 56 illustrations. Price \$0.50.

Steel casting design considered from two viewpoints, that of the designing engineer and that of the foundryman. A code, or nucleus, of a set of rules is presented for the engineer's guidance and experimental results on padding, external and internal chills, and controlled directional solidification are reported as of interest to foundrymen.

The Influence of Design on the Stress Resistance of Steel Castings, by R. A. Bull.

Heavy paper binding, 62 pp., 6x9, 22 illustrations, (1937). Price \$0.50. To members \$0.35.

A report prepared under direction of A.F.A. Steel Division Committee. Containing assembled data for the guidance of those who use and manufacture steel castings.

Foundry Costs

Heavy paper binding, 48 pages, 6x9, (1937). Price \$1.00. To members \$0.50.

Report of proceedings of 1937 convention session on foundry costs, containing cost system outlines for the malleable, gray iron and non-ferrous foundries.

Job Evaluation and Time Motion Study and Job Standardization

Heavy paper binding, 49 pp., 6x9, (1937). Price \$1.00. To members \$0.50.

Proceedings of 1937 convention session on job evaluation and foundry time study, together with discussion. The paper on time study and job standardization outlines methods used in a foundry carrying on jobbing type of work, giving charts of various molding operations. The job evaluation paper describes system used in a large plant to establish a wage rate for each job in the factory.
